the MPLS traffic according to the priorities into service categories of the ATM cell such as a CBR, a VBR, and a UBR for mapping into QoS field in the cell, there is no other choice than selecting the UBR which offers a best effort service, in order to transfer the IP packet within the ATM network 20 after embedding an area indicating a plurality of priorities of ToS (Type of Service) and the like such as a Diffserv and an Intserv of the IP packet into the area (service class : Class of Service) indicating priorities in the MPLS.

Therefore, since the priority is not considered in the UBR, it has not been ~~not~~ possible to provide a plurality of priorities such as CoS1 and CoS2 as shown in Fig.15 so that it has been disadvantageous that the quality of service (QoS) upon the mapping to the ATM traffic is not guaranteed.

Summary of the Invention

It is an object of the present invention to realize, in an ATM switch which is provided in a network where an MPLS traffic and an ATM traffic coexist, a bandwidth control of both traffics and to provide the MPLS traffic with a plurality of priorities.

For the achievement of the above object, the ATM switch according to the present invention comprises a line interface having determination means for determining, according to a received ATM cell, which traffic the cell belongs to, queuing means for queuing the cell classified based on a determination result of the determination means, and read means for reading the cell from the queuing means at read intervals based on bandwidth allocation rates of both traffics preset by the call processor (~~claim 1~~).

Namely, in the line interface of the present invention, the determination means determine whether the received ATM cell belongs to the MPLS traffic or the ATM traffic, and classify the received ATM cell to be kept waiting in queuing means based on this

determination result.

Then, the read means read the ATM cell from the queuing means at the read intervals based on the bandwidth allocation rates of both traffics preset by the call processor.

Thus, by distributing the bandwidths to the MPLS traffic and the ATM traffic at the preset allocation rates, the cells of the MPLS traffic and the ATM traffic are read out of the queuing means in the form corresponding to the bandwidth allocation rates, so that it becomes possible to perform a bandwidth control at the bandwidth allocation rates set by an operator.

In the above-mentioned case, the read means may read, in the absence of one of the two traffics, the cell of the other traffic. Thus, it is possible to make the bandwidth which is unused by one service to be used by the other service (~~claim 2~~).

Also, the call processor may perform a connection admission to read the cell only when a total of a bandwidth demanded by a connection to be newly admitted for the MPLS traffic and a present bandwidth exceeds a bandwidth determined by the allocation rates, and reject the connection admission in other cases (claim 3).

Namely, the rejection of the connection admission prevents the allocated bandwidth determined by the bandwidth allocation rate as described above from being changed by the newly admitting connection.

Moreover, the call processor may perform a connection admission to read the cell unrestrictedly regardless of a bandwidth demanded by a connection to be newly admitted for the MPLS traffic (claim 4).

Namely, upon providing the MPLS traffic as described above, the bandwidth allocation by the allocation rate is performed. However, by eliminating the bandwidth control per connection and admitting the connection unrestrictedly, it becomes possible to reduce the load of the call processor.

Moreover, the queuing means can have service classes of a plurality of priorities for the traffics, and the call processor may provide a bandwidth allocation rate varied per priority for the ATM traffic and a bandwidth allocation rate common to each priority for the MPLS traffic (claim 5).

Namely, when the MPLS traffic and the ATM traffic coexist, by providing classes of a plurality of priorities and performing the above-mentioned bandwidth control per priority, it is possible to secure the bandwidths in the order of higher priority service class.

In this case, the call processor may set the bandwidth allocation rates so that a total of the bandwidth allocation rates for the priorities exceeds 1 (claim 6). Therefore, it becomes possible to transfer the cell of the next priority after completing the cell transmission of the highest priority service class for example.

Also, the call processor may set the above-mentioned bandwidth allocation rates so that a total of the bandwidth allocation rates for the priorities becomes 1 (claim 7). Thus, it becomes possible to perform the bandwidth allocation to each priority completely according to the allocation rates.

Moreover, the read means may read the cell according to another priority when the read interval is not reached in any of the service classes (claim 8).

Brief Description of the Drawings

Fig.1 is a block diagram illustrating an embodiment of a line interface in an ATM switch according to the present invention;

Fig.2 is a diagram illustrating an embodiment of a service queue used in an ATM switch according to the present invention;

Fig.3 is a flow chart illustrating a procedure of a write controller used in an ATM switch according to the present invention;

Fig.4 is a diagram illustrating a connection information table